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Prevalence and impact of primary headache on quality of life in the general population of Arar, Northern Saudi Arabia

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ABSTRACT

Background: Headache is a common health problem; it could leads to negating influences on the quality of life. **Objective:** The study aimed to investigate the prevalence and influence of primary headache on the quality of life of the general population of Arar, Northern Saudi Arabia. **Methods:** A descriptive cross-sectional study was conducted during the period from April 1st to July 31st, 2021. Data was collected from all adult male and female attendees of 5 randomly selected primary health care centers (PHC) in Arar city. Pre-designed standardized questionnaire was used for data collection. The impact of headache on HRQL was assessed by using headache impact test (HIT-6). Collected data was analyzed using SPSS software program, Ver. 24. **Results:** Most (86.9%) of participants had a headache in the preceding year, 51.3% of them had headache monthly, 36.2% don't use any medications and in 30.3% of participants headache usually persists for hours in spite of medication. The impact of headache on participant's HRQL was little or no impact in 23.4% of them, moderate impact in 21.7%, substantial impact in 13.6% and severe impact in 41.2%. **Conclusion:** In the current study, the prevalence rate of primary headaches was 86.9% during the preceding year, which is higher than the estimated results of other studies. We discovered that headaches have a thoughtful effect on the participant's HRQL in 41.2% of the participants. Here is a substantial association on the impact of headaches in HRQL and two socio-demographic characteristics, sex and average monthly income of the participants' family.

Keywords: Prevalence; Impact; Headache; General population; Arar; Saudi Arabia

1. INTRODUCTION

Headache is one of the utmost repeatedly occurring types of neurological disorders and ranks as the third leading cause of harm caused by pain and disability resulting from a primary headache disorder called cluster, migraine,



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and tension-type headache. Headaches can be caused by secondary causes, such as drug abuse headaches (Ahmed, 2012). Therefore, headaches are classified according to the cause of primary headaches, that is, daily, benign and not caused by underlying diseases, secondary sexual headaches are caused by underlying problems, such as head injuries and space-occupying injuries (such as hemorrhages, tumors, etc.) (Raucci et al., 2019). Headache ranks as the third leading reason of years lost owing to disability (ADL) (Steiner et al., 2015). The greatest frequently occurring type of headache is primary headache (90% or more), most of which are temporary tension-type headaches. Almost everyone suffers from these types of headaches more than once in a lifetime.

The prevalence of headaches in Saudi Arabia is 63 years and occurs primarily in women and the younger age group. Tension-type headaches have the highest type of prevalence (32%) and are considered to be a common cause of doctor visits and absenteeism. Next is migraine (2.65%) (Al Jumah et al., 2020). Medical and quasi-medical staffs are under high work stress, who can experience psychogenic symptoms such as primary headaches. Headache disorders have a substantial impact on business performance, costs, and outcomes (Lin et al., 2007). It was stated that 31% of migraine patients lose one working day during the three months, resulting in 10.7 absenteeism per year due to headache symptoms. The cost of absenteeism due to migraine is \$ 13 billion annually and \$ 1,165 per person in USA (Lipton et al., 2001).

So, this study will be carried out to investigate the primary headache prevalence and its consequence on the quality of life of the overall populace of Arar, Northern Saudi Arabia.

2. MATERIALS AND METHODS

Study design, population and period

A descriptive cross-sectional study was conducted on the overall populace of Arar, Northern Saudi Arabia. The study conducted during the period from April 1st to July 31st, 2021.

Sampling techniques and sample size

The sample size was calculated by using this equation; $n = z^2pq / m^2$

Where:

z = z value (1.96 for 95% confidence level)

p = assumed proportion = 88%

q = $1 - p$ (complementary) = 12%

m = margin of error = 0.05

So the sample size equal 420 participants who fulfill the inclusion criteria

Inclusion and Exclusion Criteria

The participant's were adult male or female of the general Saudi population of Arar city, and consented to participate in this study, while exclusion criteria included, Children, non-Saudi and refused to participate in the study.

Data collection technique

Systematic random sampling technique was followed. Data was collected from all adult male and female attendees of 5 randomly selected primary health care centers (PHC) in Arar city. We included all the population attending the PHC centers, for any cause, not only the patients. After identifying the first participant randomly, every 2nd attendant was interviewed to be included in the study till the required sample is covered. Data was collected through personal interviews with the sampled population and filling the questionnaire.

Tool of data collection

Pre-designed standardized questionnaire was used for data collection. The questionnaire contains three parts. The first part collects the socio-demographic data (age, gender, marital status, working status, body mass index (BMI), physical activity, smoking and level of income. The second part includes questions around the physiognomies of headache. The third part measures the influence of headache on participants health related quality of life (HRQL) by using headache impact test (HIT-6) (Yang et al., 2011).

The HIT-6 was adapted from the longer, Internet-based HIT (Ware et al., 2003), as a short pencil-and-paper survey assessing the impact of headache on participants' lives in the past 4 weeks. It is a short tool that covers a large content of HRQL through the following domains: pain, social operation and functioning of the role, vitality, cognitive operation and psychological anguish. Each item is answered in a 5point Likert Scale (6 = never; 8 = rarely, 10 = sometimes, 11 = very often, 13 = always). The currently

recommended HIT6 score was derived from the approach of the whole score got from the broader battery of the elements, using the results of the article response theory (Kosinski et al., 2003).

The final score is obtained from the simple sum of the six elements. The Total Hit6 score varies between 36 and 78, with larger scores that reflect a greater impact. Four clusters were resultant to support in the interpretation of hit6 scores: scores ≤ 49 signifies light or no impression, scores between 50 and 55 signify a bit of impact, and scores between 56 and 59 signify a substantial impact and scores ≥ 60 they indicate a serious impact (Yang et al., 2011).

Data management and analysis

Afterward rereading and encoding the data collected, the data has been analyzed using the (SPSS 24), in which both descriptive statistics, as frequency and percentage. The qualitative variables, supports and SDs for quantitative variables while advanced analysis, such as the CHISQUARE, will be used to compare between the dependent and independent variables.

Ethical consideration

This study was approved from the research and ethical committee at Northern Border University. All ethical issues should be considered during the process of this study and all participants should fill the informed consent before participating and they should be informed about the objectives of this study and their rights to withdraw from study when needed and they must be knowledgeable around the confidentiality and privacy issues.

3. RESULTS

Majority of participants (55.5%) were within the age of 18 to 24 and (30.2%) were 25 to 34 years old, male represents 19.3% while female represents 80.7%, the majority (57%) of them were single 38.9% of them were married while, 46.3% have monthly income more than 10000 SRs, 36.5% do Physical exercise once per week, 26.1% do 2 to 3 times but 20.5% never do physical exercise and 88.4% were nonsmokers and 11.6% were smokers (table 1).

Table 1 Demographic characteristics of the studied participants (N =337)

Parameter	No. (%)
Age, y	18-24
	187 (55.5%)
	25-39
	102 (30.3%)
Sex	40-59
	44 (13.1%)
	60+
	4 (1.2%)
Marital status	Female
	272 (80.7%)
	Male
Average family monthly income (SR)	65 (19.3%)
	Single
	192 (57%)
Physical exercise (per week)	Married
	131 (38.9%)
	Divorced/Widowed
	14 (4.2%)
Smoking	<5000
	83 (24.6%)
	5000-1000
	98 (29.1%)
Physical exercise (per week)	>10000
	156 (46.3%)
	1
	123 (36.5%)
Smoking	2 to 3
	88 (26.1%)
	3
	57 (16.9%)
Smoking	Never
	69 (20.5%)
Smoking	No
	298 (88.4%)
Smoking	Yes
	39 (11.6%)

Most (86.9%) of participants had a headache in the previous year (Figure 1), 51.3% of them had headache in monthly basis, 40.4% of these headaches begin suddenly and in 44.5% headache begins in the evening, 36.2% don't use of medications, in 29.4% of participants headache usually persists for minutes with medication and last hours with medication in 30.3% of participants, while headache usually persists (without medication) for complete day in 32.6% and for hours in 51.6%. The intensity of the headache was mild in 19%, moderate in 64.1% and severe in 16.9%. Headache was bilateral in 63.8% or one-sided in 36.2%. It was also pulsating \

throbbing 47.5% and pressing in 52.5%. Headache is associated with vomiting in 16.9%, associated with photosensitivity in 51.9% and associated with noise sensitivity in 69.1%. For treatment, there was prescription in 10.1%, no prescription in 40.9% and in 49% no use of medications at all. Family history of recurrent headache was found in 27% of the participants (Table 2).

Table 2 Shows history of headache during the last year, its pattern, intensity and type

Parameter		No. (%)
Headache during the previous year	No	44 (13.1%)
	Yes	293 (86.9%)
Average frequency of headache attacks	Daily	45 (13.4%)
	Weekly	119 (35.3%)
	Monthly	173 (51.3%)
Headache increasing in frequency	No	181 (53.7%)
	Yes	156 (46.3%)
Headache onset	Progressively	97 (28.8%)
	Suddenly	136 (40.4%)
	Variable	104 (30.9%)
Headache begins	Early morning	55 (16.3%)
	Late morning	132 (39.2%)
	Evening	150 (44.5%)
Headache persists after medication for	Minutes	99 (29.4%)
	Hours	102 (30.3%)
	Day	14 (4.2%)
	No use of medications	122 (36.2%)
Headache persists (without medication) for	Minutes	53 (15.7%)
	Hours	174 (51.6%)
	Day	110 (32.6%)
Headache intensity	Mild	64 (19%)
	Moderate	216 (64.1%)
	Severe	57 (16.9%)
Side of headache	Unilateral	122 (36.2%)
	Bilateral	215 (63.8%)
Nature of headache	Pressing	177 (52.5%)
	Pulsating	160 (47.5%)
Headache is associated with nausea	No	222 (65.9%)
	Yes	115 (34.1%)
Headache is associated with vomiting	No	280 (83.1%)
	Yes	57 (16.9%)
Headache is associated with photosensitivity	No	162 (48.1%)
	Yes	175 (51.9%)
Headache is associated with noise sensitivity	No	104 (30.9%)
	Yes	233 (69.1%)
Medications used	No prescription	138 (40.9%)
	Prescription	34 (10.1%)
	No use of medications	165 (49%)
Family history of recurrent headache	No	246 (73%)
	Yes	91 (27%)

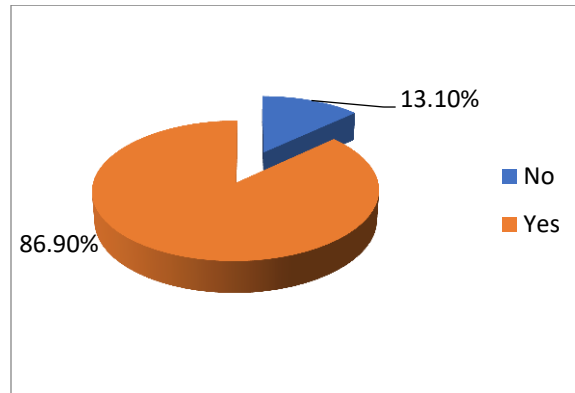


Figure 1 Prevalence of headache during the previous year among the studied population

The influence of headache on participant's health related quality of life (HRQL) by using HIT-6, it was little or no impact in 23.4% of them, moderate impact in 21.7%, Substantial impact 13.6%, Severe impact in 41.2% and the total HIT-6 Score was 55.4 ± 8.9 (Table 3 and Figure 2). About 47% of participants' quality of life were never affected by headache, 36% affected rarely, 15% affected some times and only 2% affected very often. There was significant relationship between impacts of headache on participant's HRQL and the family history of recurrent headache ($P < 0.001$), frequency ($P < 0.001$), Time of beginning of headache ($P < 0.005$), intensity ($P < 0.001$), time of beginning of headache ($P < 0.001$), headache association with nausea, photo and noise sensitivity ($P < 0.001$), headache persistence after medication ($P < 0.001$) while there was insignificant relation with headache onset, side and nature of headache ($P > 0.005$) (Table 4 & 5).

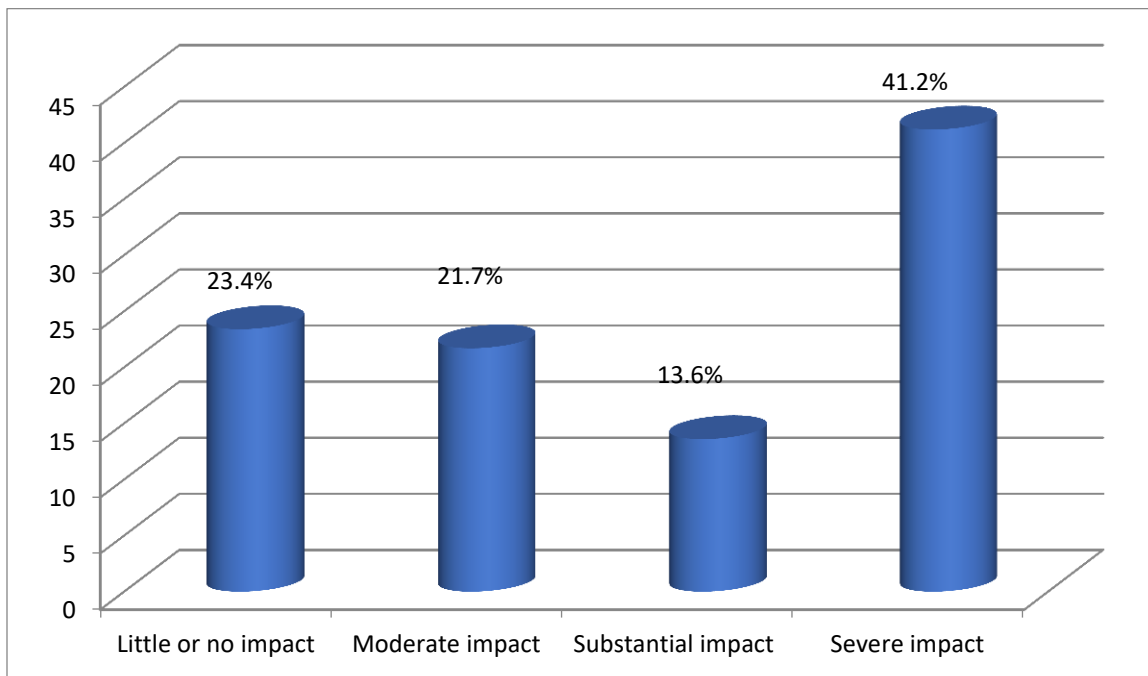


Figure 2 The impact of headache on participant's HRQL of the studied population

Table 3 The impact of headache on participant's HRQL by using HIT-6

HIT-6 results		No. (%) / Mean \pm SD (Min – Max)
HIT-6 Categories	Little or no impact	79 (23.4%)
	Moderate impact	73 (21.7%)
	Substantial impact	46 (13.6%)
	Severe impact	139 (41.2%)
HIT-6 Score		55.4 \pm 8.9 (36 – 78)

Table 4 The relationship between impact of headache on HRQL and the demographic characteristics of the studied participants

Parameter		Headache impact on QoL (HIT-6)				X ²	P-value
		Little or no impact	Moderate impact	Substantial impact	Severe impact		
Age, y	18-24	37 (46.8%)	36 (49.3%)	32 (69.6%)	82 (59%)	13.9	0.123
	25-39	25 (31.6%)	25 (34.2%)	10 (21.7%)	42 (30.2%)		
	40-59	17 (21.5%)	11 (15.1%)	3 (6.5%)	13 (9.4%)		
	60+	0 (0%)	1 (1.4%)	1 (2.2%)	2 (1.4%)		
Sex	Female	53 (67.1%)	63 (86.3%)	40 (87%)	116 (83.5%)	12.7	0.005
	Male	26 (32.9%)	10 (13.7%)	6 (13%)	23 (16.5%)		
Marital status	Single	42 (53.2%)	45 (61.6%)	28 (60.9%)	77 (55.4%)	7.5	0.279
	Married	34 (43%)	28 (38.4%)	14 (30.4%)	55 (39.6%)		
	Divorced/Widowed	3 (3.8%)	0 (0%)	4 (8.7%)	7 (5%)		
Average family monthly income (SR)	<5000	12 (15.2%)	21 (28.8%)	17 (37%)	33 (23.7%)	21.6	0.001
	5000-1000	14 (17.7%)	22 (30.1%)	13 (28.3%)	49 (35.3%)		
	>10000	53 (67.1%)	30 (41.1%)	16 (34.8%)	57 (41%)		
Physical exercise (per week)	1	18 (22.8%)	37 (50.7%)	16 (34.8%)	52 (37.4%)	20.8	0.014
	2 to 3	32 (40.5%)	13 (17.8%)	13 (28.3%)	30 (21.6%)		
	3	16 (20.3%)	9 (12.3%)	6 (13%)	26 (18.7%)		
	Never	13 (16.5%)	14 (19.2%)	11 (23.9%)	31 (22.3%)		
Smoking	No	63 (79.7%)	68 (93.2%)	44 (95.7%)	123 (88.5%)	9.8	0.021
	Yes	16 (20.3%)	5 (6.8%)	2 (4.3%)	16 (11.5%)		

Table 5 The relationship between impacts of headache on participant's HRQL and the headache in the previous year, its pattern, intensity and type

Parameter		Headache impact on QoL (HIT-6)				X ²	P-value
		Little or no impact	Moderate impact	Substantial impact	Severe impact		
Headache in the previous year	No	22 (27.8%)	10 (13.7%)	7 (15.2%)	5 (3.6%)	26.4	0.000
	Yes	57 (72.2%)	63 (86.3%)	39 (84.8%)	134 (96.4%)		
Average frequency of headache attacks	Daily	3 (3.8%)	6 (8.2%)	6 (13%)	30 (21.6%)	46.9	0.000
	Weekly	14 (17.7%)	26 (35.6%)	15 (32.6%)	64 (46%)		
	Monthly	62 (78.5%)	41 (56.2%)	25 (54.3%)	45 (32.4%)		
Headache increasing in frequency	No	60 (75.9%)	51 (69.9%)	21 (45.7%)	49 (35.3%)	43.6	0.000
	Yes	19 (24.1%)	22 (30.1%)	25 (54.3%)	90 (64.7%)		
Headache onset	Progressively	17 (21.5%)	23 (31.5%)	14 (30.4%)	43 (30.9%)	8.5	0.207
	Suddenly	33 (41.8%)	22 (30.1%)	21 (45.7%)	60 (43.2%)		
	Variable	29 (36.7%)	28 (38.4%)	11 (23.9%)	36 (25.9%)		
Time of beginning of headache	Early morning	10 (12.7%)	14 (19.2%)	5 (10.9%)	26 (18.7%)	22.2	0.001
	Late morning	17 (21.5%)	29 (39.7%)	22 (47.8%)	64 (46%)		
	Evening	52 (65.8%)	30 (41.1%)	19 (41.3%)	49 (35.3%)		
Headache persists after medication for	Minutes	18 (22.8%)	17 (23.3%)	21 (45.7%)	43 (30.9%)	30.9	0.000
	Hours	17 (21.5%)	24 (32.9%)	11 (23.9%)	50 (36%)		
	Day	0 (0%)	3 (4.1%)	1 (2.2%)	10 (7.2%)		
	No use of medications	44 (55.7%)	29 (39.7%)	13 (28.3%)	36 (25.9%)		
Headache persists (without	Minutes	29 (36.7%)	13 (17.8%)	3 (6.5%)	8 (5.8%)	48.0	0.000
	Hours	36 (45.6%)	43 (58.9%)	23 (50%)	72 (51.8%)		

medication) for	Day	14 (17.7%)	17 (23.3%)	20 (43.5%)	59 (42.4%)		
Headache intensity	Mild	34 (43%)	18 (24.7%)	3 (6.5%)	9 (6.5%)	77.7	0.000
	Moderate	44 (55.7%)	52 (71.2%)	33 (71.7%)	87 (62.6%)		
	Severe	1 (1.3%)	3 (4.1%)	10 (21.7%)	43 (30.9%)		
Side of headache	Unilateral	21 (26.6%)	31 (42.5%)	17 (37%)	53 (38.1%)	4.6	0.200
	Bilateral	58 (73.4%)	42 (57.5%)	29 (63%)	86 (61.9%)		
Nature of headache	Pressing	43 (54.4%)	42 (57.5%)	21 (45.7%)	71 (51.1%)	1.8	0.607
	Pulsating	36 (45.6%)	31 (42.5%)	25 (54.3%)	68 (48.9%)		
Headache is associated with nausea	No	69 (87.3%)	53 (72.6%)	27 (58.7%)	73 (52.5%)	29.8	0.000
	Yes	10 (12.7%)	20 (27.4%)	19 (41.3%)	66 (47.5%)		
Headache is associated with vomiting	No	73 (92.4%)	66 (90.4%)	36 (78.3%)	105 (75.5%)	14.1	0.003
	Yes	6 (7.6%)	7 (9.6%)	10 (21.7%)	34 (24.5%)		
Headache is associated with photosensitivity	No	54 (68.4%)	37 (50.7%)	22 (47.8%)	49 (35.3%)	22.4	0.000
	Yes	25 (31.6%)	36 (49.3%)	24 (52.2%)	90 (64.7%)		
Headache is associated with noise sensitivity	No	40 (50.6%)	26 (35.6%)	10 (21.7%)	28 (20.1%)	24.5	0.000
	Yes	39 (49.4%)	47 (64.4%)	36 (78.3%)	111 (79.9%)		
Medications used	No prescription	23 (29.1%)	30 (41.1%)	22 (47.8%)	63 (45.3%)	17.5	0.008
	Prescription	3 (3.8%)	6 (8.2%)	6 (13%)	19 (13.7%)		
	No use of medications	53 (67.1%)	37 (50.7%)	18 (39.1%)	57 (41%)		
Family history of recurrent headache	No	63 (79.7%)	59 (80.8%)	33 (71.7%)	91 (65.5%)	8.1	0.043
	Yes	16 (20.3%)	14 (19.2%)	13 (28.3%)	48 (34.5%)		

4. DISCUSSION

Headache may result in significant disability, including missed work days, and extra-curricular activities, decrease participation in regular activities, and loss of productivity (Jeong et al., 2018). The current study was done in Arar city, KSA among the general population to explore the primary headache prevalence rate and its influence on the quality of life. We included a sample of 337 participants, majority of participants 55.5% were within the age of 18 to 24 and 30.2% were 25 to 34 years old, male represents 19.3% while female represents 80.7%, the majority 57% of them were single 38.9% of them were married.

In the current study, the prevalence rate of primary headache was 86.9% in the last year, which is higher than the results estimated from other studies. In an earlier study by Elsherbiny et al., (2015) was the first prevalence of 1 year (51. 4%), with 61. 5% of our patients being women comparable to the prevalence of headaches in Europe, with 53% of adults have current headaches (61% among women) (Stovner & Andree, 2010) and slightly higher than the global estimate, which was 46% (Stovner et al., 2007). A much lesser prevalence rate was stated in Ethiopia (21.6 %) (Mengistu & Alemayehu, 2013) and Tanzania (23.1 %) (Dent et al., 2004), while In Africa, a greater prevalence rate was noted in Zambia (72 %) (Mbewe et al., 2015). In another study done by Al Jumah et al., (2020), they observed 1-year prevalence of all headaches was 77.2%, reducing to 65.8% when adjusted.

In our study, only 27% of our participants had family history of chronic recurrent headache, while 36.2% of the participants had migraine. In a community based studies presented that long-lasting headaches disturb nearly 3-4 %; from 0.5 to 7.3 % of the adult population in western nations (Stovner et al., 2007) and reached from 1 to 4 % in the Asian-Pacific inhabitants (Stark et al., 2013). The commonest type is chronic migraine, its prevalence ranged from 0.2 to 5.1 % (Natoli et al., 2010). It is deep-rooted that medication over employment is numerous among those with chronic headache (El-Sherbiny et al., 2015); in our survey, 51% of our participants reported taking medications for headache. In a European study credible medication misuse in headache was reported in 3 % (Stovner et al., 2007); but, lesser frequency rates were described in Germany (2 %) (Katsarava & Diener, 2008), Norway (1.7 %) (Aaseth et al., 2008) and Spain (1 %) (Colas et al., 2004).

In our study, by using HIT-6, we found that headache has little or no impact on participant's HRQL in 79 (23.4%) of the participants, Moderate impact in 73 (21.7%), Substantial impact in 46 (13.6%) and Severe impact in 139 (41.2%). About 47% of

participants' quality of life were never affected by headache, 36% affected rarely, 15% affected some times and only 2% affected very often. Moreover, we found a significant correlation between Headache impact on QoL (HIT-6) and two sociodemographic characteristics, sex and average family monthly income of the participant ($P=0.005$, $P=0.002$) respectively, while there was significant correlation between Headache impact on QoL (HIT-6) and marital status of the participants ($P=0.27$).

In Alshehri et al., (2020), it was reported that there was statistical association between occurrence of headache and gender, (P value < 0.05). In Elsherbiny et al., (2015), chronic headaches were more in patients with average age with female predominance, which contrasts with our results, although there was an increased risk of chronic headache with marriage and higher education. Many other studies have identified the number of risk factors for chronic headaches, which included the age, family history, smoking, obesity, snoring, sleep problems, wounds at the head, periods of stressful life and the low level of education (Lipton, 2011). It is fine recognized that chronic migraine is linked with non-modifiable risk factors (female sex, low socio-economic position and education) and adjustable risk influences (nervousness, depression, sleep apnea / snoring, obesity and consumer analgesics) (Carrodart et al., 2012). However, these factors were not addressed in our work and went beyond the scope of our work objective.

5. CONCLUSION

In the current study, the prevalence rate of prime headache was 86.9% in the last year, which is higher than the results estimated from other studies. We found that headache has severe impact on participant's HRQL in 41.2% of the participants. Here was an important association between Headache impact on HRQL and two sociodemographic characteristics, sex and average family monthly income of the participant.

Informed consent

Written and oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

The study was approved by the Medical Ethics Committee of Northern Border University (ethical approval code: 421029333).

Author Contributions

All authors contributed in different steps of the study.

Conflicts of interest

The authors declare that they have no conflict of interest.

Funding

This study has not received any external funding.

Data and materials availability

All data associated with this study are present in the paper.

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